APPENDICITIS.

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MR. PRESIDENT AND GENTLEMAN: — No apology is required for bringing before you for discussion upon this occasion one of the most important surgical affections of the present day. Appendicitis is important by reason of its frequency; by reason of its character, serious in all cases, and fatal in many; and also by reason of the grave difficulties attending its management in numerous instances.

Inflammation of the vermiform appendix varies in degree from a simple catarrhal affection indicated by a slight and transient bellyache; to sudden and complete gangrene of the whole organ attended by symptoms of most profound collapse, which may terminate fatally in twenty-four to forty-eight hours in spite of any and all modes of treatment. In not a few instances the symptoms are so slight, and give so little discomfort, that their true significance is not suspected, until frequent recurrence, or increased severity reveals the real character of the affection.

The chief source of danger from inflammation of the appendix, as you all so well know, is the resulting peritonitis. The danger is usually in direct proportion to the extent of the inflammatory process, general peritonitis being one of the most serious affections with which we have to contend. Not infrequently insidious in its approach, remitting in its progress, devoid of alarming symptoms, the patient is beyond all help before his real condition is apparent to the attendants.

[1] Read before the White Mountain Medical Society at Hanover, N. H., July 31, 1894.

Sudden abdominal pain, aggravated by coughing and tenderness, are the characteristic symptoms of peritonitis, and peritonitis in the male in nine cases out of ten is due to inflammation of the appendix. In the female the Fallopian tubes, ovaries and other pelvic structures require consideration before arriving at a final diagnosis. A painful, tender belly, whether the tenderness be local or general, should always suggest peritonitis to the observer, whatever other symptoms may be present, or absent. Rigidity of the abdominal walls, and fever render the diagnosis more certain. Tenderness or muscular rigidity more marked on the right side of the median line, together with vomiting and tympanites, are additional evidence in favor of appendicitis. Previous attacks also suggest the nature of the affection. In some cases of undoubted inflammation of the appendix, as shown by operation or autopsy, there is no localization of symptoms at any time, so that we are compelled to fall back upon the general statement already made, that peritonitis in the vast majority of instances means appendicitis.

The diagnosis is made almost certain by the presence of a bunch. This is usually situated in the right lower quadrant of the abdomen, but may be located near the liver or even upon the left side, in fact in almost any part of the abdomen. Instead of a bunch there may be marked local resistance on the right side in strong contrast to the elasticity of the opposite side.

Occasionally the tender spot and the tumor may be detected by a rectal or vaginal examination, both of which should always be made. The appendix is at times located deep in the true pelvis alongside the rectum, in which case the characteristic symptoms might not be apparent upon the surface of the abdomen, until late, or even not at all.

Again, a tumor may be obscured by distention, by rigidity of the muscles, or by great resistance to manipulations, so that its absence is of little importance, as regards the diagnosis. It is no unusual event to find large quantities of pus in the peritoneal cavity in the absence of a tumor, and of localized pain and tenderness. Even a tympanitic abdomen may contain a large amount of pus. Persistent pain, tenderness, and muscular tension tell the real condition of things inside. They indicate the presence of peritonitis, and that, as mentioned above, in the vast majority of cases met with in every-day work, means appendicitis, and should be recognized and treated as such.

The diagnosis being reasonably certain we next have to consider the management of the case. About half of the persons afflicted with this disease recover under simple treatment, such as rest, leeches, opiates, fomentations, etc. Of those, who undergo operation, from one-half to three-quarters recover. One of the most difficult questions arising in the treatment of the malady is to decide, what cases require operation, and also, when shall it be done. It is much easier for an experienced surgeon to decide these questions in his own mind at the bedside, than it is to lay down rules for others to follow. In a general way, however, it may be said, that the cases in which the symptoms are sudden, sharp and severe, thereby indicating perforation and gangrene of appendix, demand early and prompt operation, that is, on the second or third, and perhaps upon the first day of the disease. Cases of moderate severity had better be operated upon in three or four days, if there are no marked and sure signs of diminution of the symptoms. But frequent and careful observations are necessary to prevent one from being deceived by latent symptoms. No improvement is reliable until it has lasted for more than twenty-four

hours. Too much reliance must not be placed upon the pulse and temperature, as they are often very deceptive in their character.

A patient with this affection is never safe until he can pass wind. I care not how favorable all the other symptoms may be, so long as he cannot get rid of the flatus in the natural way, he is in a condition to give anxiety to his medical attendant. Obstruction of flatus may be due to intestinal paresis, or to mechanical causes. Septic infection often produces paralysis of the intestines, and thereby allows of their great distention. In a fatal case at the Boston City Hospital last winter, Dr. Councilman, the pathologist, found that death was caused by portal thrombosis, that is, thrombosis of one of the mesenteric vessels, which produced paresis of peristalsis. The gravity of distention due to intestinal paralysis cannot be overestimated, as a fatal result is the rule. Rumbling of gas in the bowels is always a welcome sound, and one of the most favorable symptoms in peritonitis is a free escape of flatus.

Light cases of appendicitis require operation when the symptoms of improvement come to a standstill. I cannot agree with those, who say, that every case of appendicitis, however slight, should be operated upon. I still have some respect for the peritoneum. About half of the patients get well without radical measures, and unless time and experience shall prove that these people are pretty sure to have a recurrence, it is difficult to see any good reason for subjecting them all to operation. I very much doubt if that practice will ever come into general acceptance by the profession.

Cases attended by frequent exacerbations are better treated by abdominal section. I should seldom, if ever, wait longer than the second relapse, before advising operation. Relapses and recurrences indicate

a condition of things in and about the appendix which Nature cannot readily repair, and too much risk should not be incurred by waiting. I venture the assertion that more mistakes are made by late than by early interference.

It should be said that this question of operation might be affected by the patient's station in life. It is not as imperative that an early operation should be performed upon a person of means, who can command at any and all times the best professional skill, as it is in the case of one living a long distance from skilful aid, or of a poor man obliged to work for a living, and subject to all the risks and exposure incident to such a life. Moreover, the latter person can ill afford the time and expense for a long convalescence.

A tumor does not necessarily call for an operation. I know of several members of our profession, one of whom is an honored occupant of an important chair in your own medical school, who have recovered from attacks of this disease attended, among other symptoms, with a tumor. The bunch would indicate the site of the incision, rather than the necessity for an operation. In not a few of the worst cases, cases calling most imperatively for an operation, no tumor is present. To give exit to the pus, and to get rid of the source of irritation, is the object of the operation. In some instances there is no suppuration in the bunch. It is solid, and composed of inflammatory products, which do not soften and break down, but are removed by absorption. I would like to remark in passing, that an early appearance of the tumor indicates that the appendix lies close to the abdominal parietes, rather than deep in the iliac fossa, or true pelvis. In one of my cases the bunch made its appearance upon two occasions within twenty-four hours, and at the operation, after her recovery from the second attack, the appendix was found as above indicated.

For recurring appendicitis in which there is a distinct interval between the attacks, I believe most thoroughly in an operation for removal of the offending organ. This method of treatment is reasonably safe, and it is effectual. The risk of future, and perhaps of a fatal attack is thereby removed, and the mental anxiety, which is by no means an insignificant factor in the matter, is relieved. In short, the best of arguments, reason and experience are in favor of the operation, and nothing of importance can be brought against it.

Two attacks of appendicitis, even if slight, and not too far apart, justify an operation for removal. In one of our recent operations during the interval after the second attack in six months, the appendix was distended with a purulent fluid, threatening perforation at any time.

A patient with recurring, or "sleeping," appendicitis is in constant danger of an explosion, which may prove fatal in spite of the most prompt and skilful treatment; hence the very great importance of interfering at the proper time.

By way of summary then, I would say, that an operation is indicated: (1) In very severe cases, and immediately. (2) In moderate cases in three or four days, if the symptoms are not progressing favorably. (3) In slight cases, if they do not get well in a reasonable time, or do not steadily progress toward recovery. (4) In cases attended with frequent exacerbation without any distinct interval. (5) In recurring cases, and, as a rule, in the interval after the second attack. (6) Cases of doubtful diagnosis, in which the symptoms do not subside within a reasonable time, may be subjected to exploratory incision, with the expectation, that more good than harm will be done in the long run. (7) Patients who must live out of reach of competent

medical attendance, as well as those in the humbler walks of life, may require operation under circumstances not otherwise advisable.

On the other hand, light cases, and those of moderate severity that show signs of improvement upon the third day, do not require operation during the first attack, providing convalescence is not interrupted or prolonged.

I would not advise operation during profound collapse, as I have never seen a person rally under these circumstances. General peritonitis does not necessarily preclude an operation, yet the prognosis is exceedingly grave in these cases. I have seen only one patient recover after laparotomy performed during a severe general peritonitis. As the result, however, is occasionally successful after operative treatment, as well as under the expectant method, the physician may be left to decide this very evenly balanced question for himself, according to his own notions upon the matter, with the assurance that he will find ample authority for whichever method he may select. My own custom is to recommend operation, if I think the patient's condition will enable him to get through it, and not succumb during its performance. I cannot urge too strongly, that each and every case of appendicitis should be watched very carefully until the fate of the patient is decided. He should be seen at least twice a day; and if the symptoms are very severe, he ought to be visited every four to six hours, if circumstances will permit. I fully appreciate the difficulties of carrying out these suggestions in thinly settled regions in the country, where the physician lives many miles away from his patient. Under these conditions operative measures might be resorted to at an earlier period, rather than run too much risk by waiting for further developments.

Peritonitis, as you know, is in many instances very rapid in its progress, oftentimes invading the serous cavity throughout its entire extent in a few hours. The shock and prostration under these circumstances is most profound, precluding in many cases any operative interference. Hence the importance of close and frequent observation, as well as prompt action, before it is too late to avail ourselves of the natural recuperative powers of the system.

I shall touch upon only a few points as to the manner of doing laparotomy for appendicitis. Two classes of cases are met with in our every-day work.

In the first, the incision leads directly into the abscess cavity, which may be a portion or the whole of the peritoneal space. In the most favorable conditions the disease is limited to a small part of this cavity by a retaining wall of lymph, and an operation is little more than opening a deep abscess. This may be done by the so-called Hilton method, which consists in dividing the tissues down to the transversalis fascia, puncturing the abscess with a blunt instrument, as a director, and dilating the opening thus made to the desired extent.

In the second class of cases, on opening the peritoneal cavity, the disease is found to be walled off deep in the pelvis, or in a mass of intestines or omentum, and drainage is possible only through the general peritoneum. This is a very undesirable complication to encounter, as pus in the peritoneal cavity is one of the most dangerous conditions attending the affection. The peritoneum is to be protected by carefully packing sterilized gauze all about the abscess, leaving a space in the centre or to the outer side for the exit of the discharges and for drainage. Care is to be taken in the manipulations that the abscess is not prematurely ruptured, thus allowing the pus to escape

into the peritoneal cavity among the coils of the intestines before the packing is complete. Everything being in readiness, the retaining wall can usually be broken down easily with the finger, and the examination carried to the desired extent.

The cavity of the peritoneum, or of the abscess, having been opened, several difficulties may now be expected. Naturally the first object to be sought for is the appendix. In the late cases it may have sloughed off, when it will very likely escape in the discharge, together with the little fecal mass so often found in these conditions. Not infrequently, however, it will be so covered over by exudation and adhesions, as to be indistinguishable from the other structures, either by sight or touch. And just here comes up the important question, as to how far the search for the offending member shall be carried. I think that the present concensus of opinion is in favor of doing much less violence to the parts in our endeavors to find and remove the appendix, than formerly. It is no easy matter to detect it, and to dig it out of a mass of adhesions, in which may be omentum, intestines, blood-vessels, etc., all located deep in the pelvis. Nor are such efforts, which are necessarily made in the dark, and largely by the sense of touch, free from danger.

So far as I can judge from the experience of others, as well as of my own, it makes little difference in the immediate result, whether the appendix is removed at the time of the operation or not. Dr. Miles F. Porter, of Fort Wayne, in the *American Journal of Medical Sciences* for December, 1893, gives a table of 448 cases of appendicitis treated in various ways. In 122 instances the appendix was removed at the time of the operation. The recoveries were, in round numbers, 80 per cent. One hundred and fifty-four cases were treated by simple incision and drainage; the results

were 81 per cent. of recoveries. This difference is not of sufficient importance in itself to influence the operator's action. If future experience shall prove, as it now bids fair to do, that patients do as well when the appendix is left as they do when it is removed, the labors and anxieties of the operator, as well as the danger to the patient, will be very much diminished. For my own part I do not search half as curiously for this organ, as I formerly did. If it is pretty readily found, an effort is made to remove it; otherwise the case is treated like any deep suppuration.

Another important point requires a moment's notice here, and that is the future condition of the patient. Does removal of the appendix render him any less likely to recurrence? While time and experience will not yet allow us to decide this point too positively, I think that recovery is more sure and speedy, and relapses rather less common in those cases in which the appendix has been removed, either by the surgeon or by natural processes. I have never seen a recurrence after removal of the tube; I have seen two or three relapses under the opposite condition.

According to our present light, however, relapses are not common enough to justify too earnest and thorough search for the appendix at the time of operation. The danger from infecting the peritoneum, and from too prolonged manipulations increasing shock and prostration, outweighs any benefit which may be expected from a removal of the appendix under the above circumstances.

In searching for this organ, experience proves herself to be a most valuable teacher. The practised finger in most instances is enabled to detect the hard, cord-like body of the appendix, and by careful manipulations to sever its attachments, and bring it up into sight. Its mesentery having been tied off, a ligature

is applied as near to the base as possible, and the free portion is cut away.

Some surgeons invert the end of the stump, and bring the serous surfaces together with sutures, a plan that is feasible provided the tissues are not too friable. There are successful operators, however, who do not apply any ligature at all. They imitate Nature in the management of the stump by simply letting it alone, and allowing it to heal by granulation. As patients do well under both methods of treatment, one is not disposed to be too dogmatic in the matter. Personally I use ligatures and sutures in dressing the stump, as I believe in taking every precaution to prevent intestinal leakage, and also to hasten the repair of the parts.

I used to fear that silk placed at the bottom of a suppurating cavity tended to keep open the sinus, and thus to prolong convalescence by acting as a foreign body. I have no doubt that such is the fact in exceptional instances, but I do not think that it occurs often enough to influence our mode of treatment. The objections to catgut are that it is more uncertain in strength and durability, and is less readily sterilized. It is very good for ligation of blood-vessels, but in my opinion it is inferior to silk as a ligature for the appendix.

Fecal fistulæ are not very rare after the removal of the appendix in suppurating cases, but they usually close in one or two weeks of themselves. In rare instances, when complicated with tuberculosis, they do not heal, but serve as a factor in wearing out the patient by malnutrition, and exhaustion. The only permanent fistulæ I have seen in patients, who have in other respects regained fair health, have followed spontaneous rupture of the abscess. I cannot recall one after operation, although it doubtless may occasionally occur. In my own mind I have no doubt that fecal

fistulæ and troublesome sinuses depend far more upon the want of vitality in the tissues involved, than upon any particular method of treatment. The key-note of the surgeon's duty is incision and drainage, and so long as that is fairly accomplished, we need not spend overmuch time upon the minor details.

For drainage I prefer the baked gauze, except in deep or large cavities requiring frequent irrigation, when two or more rubber tubes may be used in addition to the packing. In several of my later operations, I have not washed out the suppurating cavity at all, but have contented myself with making a free incision, removing the appendix, when feasible, and establishing good drainage. Thus far the results have been as good as when treated by free irrigation. The latter is especially indicated in cases attended by abundant and fetid suppuration. The peritoneal cavity can neither be drained nor irrigated, when the seat of general adhesive inflammation. However freely the adhesions may be broken up, fresh ones will form within twelve hours, rendering irrigation and all methods of drainage ineffectual and unsatisfactory.

From the fact that many cases seem to be benefited by saline and other cathartics, there will always be a difference of opinion as to their real value in the early stages of appendicitis. The family physician has taught the surgeon some valuable lessons on this point. It is evident that cathartics can do only harm in cases of perforation with no external outlet for the discharges. They not only tend to liquefy the contents of the bowels, but they also increase peristalsis, and thereby may flood the peritoneal cavity with the most deleterious of all substances, liquid feces. Cases of distention from intestinal paresis are made worse by cathartics, as they may cause or aggravate the vomiting, which is a serious symptom in this affection.

After operation and the establishment of drainage, I know of nothing which relieves pain due to distention so surely and so effectually as salines given in small and oft-repeated doses. Few practitioners of experience deny the value of laxatives under these conditions. In the early stages of light or catarrhal cases they very likely are beneficial in establishing intestinal drainage by unloading the vessels of the portal system, as well as by removing irritating substances from the bowels. They are to be used carefully and judiciously, and only in mild cases, and always with the idea in mind that an operation may be necessary at any moment, even after the production of free catharsis. It is the opinion of many practical surgeons, that even the mild cases do as well under the opiate as under the cathartic treatment. While patients often recover under both methods, my own experience leads me to think, that, as a rule, the former is safer than the latter, and that the results are full as favorable.

Opiates are indispensable in the treatment of this affection, and yet the same objection to their use obtains as in strangulated hernia. They may obscure and cover up the patient's real condition. The amount of opiate required is an indication of the severity of the pain, and hence of the character of the attack.

In closing, allow me to say, as I said at the beginning, that this affection is one of the most important that comes to the physician's notice, not only because of its grave character, but because so much depends upon its proper management. Many of the worst cases will die in spite of the most timely and judicious treatment, but more will get well if promptly recognized and carefully managed. One of the most satisfactory reflections which a physician can have is, that he has shown good judgment in the treatment of his patients, and in no class of affections is this fact more

evident, than in the prompt recognition and judicious treatment of appendicitis.

[Soon after presenting the above paper the writer was seized with his third severe attack of appendicitis. The first one occurred seventeen years ago; the second two years ago; each lasted about three months. The symptoms of the first two attacks were pain at the epigastrium, marked prostration and emaciation. There were no indications of trouble in the right side of the abdominal cavity. Just a week after the commencement of the last attack, pain, tenderness and muscular rigidity were pronounced in the right iliac region. Three days later laparotomy was performed by Dr. M. H. Richardson. There was an abscess below the brim of the true pelvis and behind the cecum, surrounded by old and fresh adhesions, implicating the sigmoid flexure and the rectum. The appendix was found to be shrivelled up to a small cord, and being firmly incorporated in the dense mass of adhesions was not removed. The principal features of the case were its long duration and unusual location of the symptoms. It was only during convalescence that pain was located outside of the epigastric region. During this time moderate griping at stool was felt behind the pubes, due evidently to the adhesions found at the time of the operation.]